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TITLE: Hourglass with bypass duct

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INVENTOR- INFORMATION:

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US-CL-CURRENT: 368/93**CLAIMS:**

What is claimed is:

1. An hourglass comprising:

a first reservoir having a collecting end and a transfer end, the transfer end being smaller than the collecting end;
a second reservoir having a collecting end and a transfer end, the transfer end being smaller than the collecting end;
a necked duct extending between the transfer end of said first reservoir and the transfer end of said second reservoir, the necked portion providing a restricted fixed flow path between the first reservoir and the second reservoir; and
a bypass duct extending between the collecting end of said first reservoir and the collecting end of said second reservoir, the bypass duct having a valve that allows capture of an amount of material used to measure time with the hourglass, so that the amount of granular material held in said first reservoir will flow from the first reservoir through the transfer end of said first reservoir through the necked duct and into the transfer end of said second reservoir when said first reservoir is placed over said second reservoir, and so that granular material held near the collecting end of said second reservoir is transferred to the bypass duct and retained in the bypass duct by the valve by tilting the second reservoir to allow the granular material to enter the bypass duct, so that the granular material held in the bypass duct by the valve is used as reference for comparisons of time measurements and flow through the bypass duct to the collecting end of the first reservoir.

2. An hourglass according to claim 1 wherein the collecting end and the transfer end of the first reservoir are at a distance from one another, and the collecting end and the transfer end of the second reservoir are at a distance from one another, and the

transfer end of the first reservoir and the transfer end of the second reservoir are between the collecting end for the first reservoir and the collecting end of the second reservoir.

3. An hourglass according to claim 2 wherein said bypass duct has a cross sectional area and said necked duct has a cross sectional area, and the cross sectional area of the bypass duct is several times the cross sectional area of the cross sectional area of the necked duct.

4. An hourglass according to claim 1 wherein said necked duct and said bypass duct are spaced apart from one another.

5. An hourglass comprising:

an amount of granular material;
a first reservoir having a collecting end and a transfer end, the transfer end being smaller than the collecting end;
a second reservoir having a collecting end and a transfer end, the transfer end being smaller than the collecting end;
a necked duct joining the transfer end of said first reservoir and the transfer end of said second reservoir, the necked portion providing a restricted fixed flow path for allowing a slow and fixed flow rate of granular material between the first reservoir and the second reservoir; and

a bypass duct extending between the collecting end of said first reservoir and the collecting end of said second reservoir, the bypass duct having a valve, so that an amount of the granular material held in said first reservoir will flow from the first reservoir through the transfer end of said first reservoir through the necked duct and into the transfer end of said second reservoir when said first reservoir is placed over said second reservoir, and so that granular material held near the collecting end of said second reservoir is transferred to the bypass duct and temporarily retained in the bypass duct by the valve by tilting the second reservoir to allow the granular material to enter the bypass duct and flow through the bypass duct to the collecting end of the first reservoir.

6. An hourglass according to claim 5 wherein the collecting end and the transfer end of the first reservoir are at a distance from one another, and the collecting end and the transfer end of the second reservoir are at a distance from one another, and the transfer end of the first reservoir and the transfer end of the second reservoir are between the collecting end for the first reservoir and the collecting end of the second reservoir.

7. An hourglass according to claim 6 wherein said bypass duct has a cross sectional area and said necked duct has a cross sectional area, and the cross sectional area of the bypass duct is several times the cross sectional area of the cross sectional area of the necked duct.

8. An hourglass according to claim 5 wherein said necked duct and said bypass duct are spaced apart from one another.

9. An hourglass according to claim 5 wherein said bypass duct extends from the collecting end of said first reservoir to the collecting end of said second reservoir while extending away from said first reservoir and said second reservoir.

10. A method for storing, resetting and varying the amount of time measured by an hourglass, the method comprising:

providing an hourglass having:

a first reservoir having a collecting end and a transfer end, the transfer end being smaller than the collecting end;

a second reservoir having a collecting end and a transfer end, the transfer end being smaller than the collecting end; a necked duct extending between the transfer end of said first reservoir and the transfer end of said second reservoir, the necked portion providing a restricted fixed flow path between the first reservoir and the second reservoir; and a bypass duct extending between the collecting end of said first reservoir and the collecting end of said second reservoir, the bypass duct having a valve; and tilting the hourglass so that an amount of granular material held in said first reservoir will flow from the first reservoir through the transfer end of said first reservoir through the necked duct and into the transfer end of said second reservoir when said first reservoir is placed over said second reservoir, and so that granular material held near the collecting end of said second reservoir is transferred to the bypass duct and selectively held in the bypass duct by the valve to allow use of the granular material as a time reference prior to flowing into to the collecting end of said first reservoir by tilting the second reservoir to allow the granular material to enter the bypass duct and flow through the bypass duct to the collecting end of the first reservoir.

11. A method according to claim 10 wherein the collecting end and the transfer end of the first reservoir are at a distance from one another, and the collecting end and the transfer end of the second reservoir are at a distance from one another, and the transfer end of the first reservoir and the transfer end of the second reservoir are between the collecting end for the first reservoir and the collecting end of the second reservoir.

12. A method according to claim 11 wherein each of said bypass ducts has a cross sectional area and said necked duct has a cross sectional area, and the cross sectional area of each of the bypass ducts is several times the cross sectional area of the cross sectional area of the necked duct.